

REMARKS

Claims 1-20 are pending in the application. Reconsideration of this application is respectfully requested.

The Office Action rejects claims 1-20 under 35 U.S.C 103(a) as unpatentable over U.S. Patent No. 6,361,138 to Seino et al., hereafter Seino, in view of U.S Patent No. 5,459,496 to Hanabusa et al., hereafter Hanabusa.

Independent claims 1 and 10 are directed to a method and a processor for determining service criteria of a printhead in a printer. The inventors have recognized that based on various criteria (that are discussed at pages 13-15 of the specification), an age of the printhead can be determined and a service procedure that is based on the calculated age is selected so as to have a prolonging impact on the lifetime of the printhead.

In contrast, Seino discloses a method and apparatus for collecting and storing the use history of a replaceable ink cartridge that supplies ink to a separate printhead. That is, Seino's procedures deal with replaceable ink cartridges that have a short lifetime compared to the lifetime of the printhead. The use history is stored in a memory built into the replaceable ink cartridge, which upon removal can be returned to the manufacturer for analysis.

Seino teaches a procedure in Fig. 6 for filling the printhead with ink from a newly installed ink cartridge and a procedure in Fig. 7 that is performed after the printhead is filled with ink. These procedures have nothing to do with selecting an appropriate service procedure for the printhead itself based on a calculated age of the printhead as recited in claims 1 and 10. }

The Office Action's reading of the claimed printhead service procedure and processor on the replaceable ink cartridge procedures of Seino is a gross misinterpretation of the plain language of independent claims 1 and 10. With respect to claim 1, Seino lacks the steps of determining and selecting. With respect to claim 10, Seino lacks a processor that performs the steps of determining and selecting.

The Office Action reads the step of determining a calculated age of the printhead on element C of Seino's flowchart of Fig. 6. Element C is described at column 4, lines 65-67, as determining whether or not a newly installed ink cartridge exceeds its expiration date. This step assures that the newly installed ink cartridge (and not the printhead) has not exceeded its useful life due to prior use (see discussion at column 7, lines 39-67) or to a long shelf life. In contrast, claim 1 recites: "determining a calculated age of the printhead". Thus, Seino lacks the determining step of claim 1 and of the processor of claim 10.

The Examiner argues that Applicants' disclosure shows that the printhead age is actually calculated by the volume of ink expelled or number of previous service procedures and that, therefore, age is equivalent to use. This argument is irrelevant. Seino's step C merely determines if a newly installed ink cartridge exceeds its expiration date. This is not a calculated age based on ink consumed or number of service procedures performed, but rather is merely a check of whether the ink cartridge's expiration date has already occurred.

The Examiner also refers to column 3, lines 47-49 in support of the argument. These lines refer to data that is stored in storage systems 32 and 34 of ink cartridges 1 and 2. This data is not used by the flow chart of Fig. 6, but rather is used by the manufacturer when the ink cartridge is returned.

The Office Action reads the selecting step on element F of Seino's flowchart of Fig. 6. Element F is described at column 5, lines 7-18, as determining whether the ID data of the current ink cartridge and the ID data of the previous ink cartridge are

identical. Based on the identity determination of step F and a user designation of a refill product at step H, ink is taken in a normal, middle or large amount (steps G, I and J) to fill the printhead for ensuing print operations at step K of Fig. 7. Taking ink from an ink cartridge to fill the printhead based on an identity determination is not selecting a service procedure based on a determined calculated age of the printhead as recited in claims 1 and 10. It is noted that the permissible life test of step C is a pre-condition to step F, but is not the basis upon which step F makes a selection decision. Thus, Seino lacks the selecting step of claim 1 and of the processor of claim 10.

The Office Action concedes that Seino does not determine a calculated age of the printhead as claimed, but that Seino does determine a calculated age of the ink cartridge. The Office Action contends that it is well known in the art that the ink cartridge is an integral part of the printhead, citing Hanabusa as evidence thereof. The Office Action concludes that it would have been obvious to one of ordinary skill in the art to calculate the age of the printhead by calculating the age of the ink cartridge as taught by Seino, since it was well known in the art that the ink cartridge is an integral part of the printhead as taught by Hanabusa.

The conclusion of obviousness is erroneous. First, Seino lacks the steps of determining and selecting as discussed above. Hanabusa does not teach the steps of determining and selecting. Therefore, the combination of Seino and Hanabusa cannot render the invention claimed by claims 1 and 10 obvious.

Second, the alleged obviousness combination is improperly based on the hindsight of Applicants' disclosure. Such hindsight reconstruction of the art cannot be the basis of a rejection under 35 U.S.C. 103. The prior art itself must suggest that modification or provide the reason or motivation for making such modification. In re Laskowski, 871 F.2d 115, 117, 10 USPQ 2d 1397, 1398-1399 (CAFC, 1989). "The invention must be viewed not after the blueprint has been drawn by the inventor, but as it would have been perceived in the state of the art that existed at the time the invention was made." Sensonic Inc. v. Aerosonic Corp. 38 USPQ 2d 1551, 1554 (CAFC, 1996), citing

Interconnect Planning Corp. v. Feil, 774 F. 2d 1132, 1138, 227 USPQ 543, 547 (CAFC, 1985).

Seino determines an identity of a newly installed ink cartridge (a new cartridge or one that still has useful life) and selects a printhead filling procedure based on the identity determination. Hanabusa's integral printhead and ink cartridge has no need for such determination and selection since the printhead and ink cartridge are integral. That is, there is no need to make any determination of ink cartridge compatibility with the printhead. Thus, there is no motivation for one skilled in the art to combine Seino and Hanabusa.

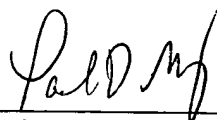
For the reasons set forth above, it is submitted that the rejection of claims 1-20 under 35 U.S.C. 103(a) is erroneous and should be withdrawn.

It is respectfully requested for the reasons set forth above that the rejection under 35 U.S.C. 103(a) be withdrawn, that claims 1-20 be allowed and that this application be passed to issue.

For the reasons set forth above, it is submitted that this amendment places the application in condition for allowance. If this amendment is deemed to not place the application in condition for allowance, it is respectfully requested that it be entered for the purpose of appeal.

Respectfully Submitted,

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1. (Original) A method of determining service criteria for a printhead in a printer comprising:
 - receiving an indication that service is needed;
 - determining a calculated age of said printhead; and
 - selecting a service procedure based on the determined calculated age.
2. (Original) The method of claim 1, wherein said selected service procedure has an impact on the long term life of said printhead that is proportional to the calculated age.
3. (Original) The method of claim 1, further comprising classifying said calculated age as one of a plurality of phases.
4. (Original) The method of claim 3, wherein said plurality of phases include at least a beginning of life phase and a maturity phase.
5. (Original) The method of claim 3, wherein said plurality of phases include at least a beginning of life phase, a middle of life phase and a maturity phase.
6. (Original) The method of claim 5, wherein said selected service procedure for said beginning of life phase has a low impact on the long term life of said printhead.
7. (Original) The method of claim 5, wherein said selected service procedure for said middle of life phase has a moderate impact on the long term life of said printhead.
8. (Original) The method of claim 5, wherein said selected service procedure for said maturity phase has a severe impact on the long term life of said printhead.

9. (Original) The method of claim 1, wherein determining said calculated age comprises utilizing at least one factor selected from the group consisting of: volume of ink expelled, type of previous service procedures, number of previous service procedures, types of previous failures, number of previous failures, time and number of print jobs printed.

10. (Original) An apparatus for determining service criteria for a printhead in a printer comprising:

 circuitry for receiving an indication that service is needed; and

 a processor for determining a calculated age of said printhead and selecting a service procedure based on the determined calculated age.

11. (Original) The apparatus of claim 10, wherein said selected service procedure has an impact on the long term life of said printhead that is proportional to said calculated age.

12. (Previously amended) The apparatus of claim 10, further comprising circuitry for classifying said calculated age as one of a plurality of phases.

13. (Previously amended) The apparatus of claim 12, wherein said plurality of phases include at least a beginning of life phase and a maturity phase.

14. (Previously amended) The apparatus of claim 12, wherein said plurality of phases include at least a beginning of life phase, a middle of life phase and a maturity phase.

15. (Previously amended) The apparatus of claim 14, wherein said selected service procedure for said beginning of life phase has a low impact on the long term life of said printhead.

16. (Previously amended) The apparatus of claim 14, wherein said selected service procedure for said middle of life phase has a moderate impact on the long term life of said printhead.

17. (Previously amended) The apparatus of claim 14, wherein said selected service procedure for said maturity phase has a severe impact on the long term life of said printhead.

18. (Previously amended) The apparatus of claim 10, wherein said processor for determining said calculated age comprises utilizing at least one factor selected from the group consisting of: volume of ink expelled, type of previous service procedures, number of previous service procedures, types of previous failures, number of previous failures, time and number of print jobs printed.

19. (New) The apparatus of claim 10, wherein said service procedure has a prolonging impact on the useful life of said printhead.

20. (New) The method of claim 1, wherein said service procedure has a prolonging impact on the useful life of said printhead.